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**INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT**

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**APPRAISAL OF BAYGORRIA HYDROELECTRIC PROJECT**

**URUGUAY**

**October 2, 1956**

**Department Technical Operations**

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CURRENCY EQUIVALENTS

1 U.S. Dollar	=	2.1 pesos
1 peso	=	\$.48
1,000,000 pesos	=	\$476,190

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# APPRAISAL OF THE BAYGORRIA HYDROELECTRIC PROJECT

## U R U G U A Y

### SUMMARY

This report covers the appraisal of a project for the further expansion of the power facilities of UTE, an autonomous Government agency, to which the Bank has previously made two loans totaling the equivalent of \$38.5 million.

UTE, which was established in 1912, now supplies all power consumed by the public and practically all telephone service in Uruguay. In July, 1956, UTE owned and operated power facilities with an installed capacity of 285,500 kw and had 50,000 kw under construction. It supplies energy to the most populous part of the country through a rather extensive transmission system and to the remainder of the country by diesel generation.

The principal market for electricity is in Montevideo, the capital and largest city in the country, which in 1955 consumed 79% of UTE's total sales of 776 million kilowatt hours.

Since 1947 UTE's sales have increased at an average rate of 9.7% a year. For the period 1956-1963 UTE estimates that its sales will increase at least 9% a year and reach 1,590 million kwh by 1963. To meet the increasing demand for power UTE has formulated an expansion program which includes the construction of a 103,000 kw hydroelectric station, known as Riocon de Baygorria, on the Rio Negro, a high-tension transmission line 340 kilometers long and a collector system in Montevideo to provide better interconnection between the existing thermal plants in Montevideo and the existing and proposed hydro plants and the various high-tension lines radiating from the city. This project is estimated to cost the equivalent of \$52 million exclusive of interest during construction. The Bank has been requested to finance the foreign exchange cost of the project, estimated at \$25.5 million.

About 7% of the drainage area of the Rio Negro lies in Brazil and, therefore, the average flow of the river at the Brazilian border is very small. Consequently, the diversion of all or a part of the flow within the borders of Brazil would have only a negligible effect on the operation of the Baygorria project. As the project will be downstream from an existing hydro station in Uruguay, it cannot affect Brazil.

Construction of the project started in August and is scheduled to be completed in the first quarter of 1961.

Energy from a thermal plant of similar firm capacity, located in Montevideo, would cost approximately 25 to 30% more than energy from the Baygorria project.

The project has been thoroughly studied and the estimated costs appear reasonable. UTE's plans for financing the project are satisfactory,

and its technical staff, supplemented by consultants who have already been retained, will be capable of supervising the construction of the project.

UTE should be the borrower. Its present financial position is sound and its present rate structure should produce revenues sufficient to provide an adequate return on its investment in the foreseeable future.

The project is suitable as a basis for a loan of the equivalent of \$25.5 million. A term of 25 years, including a grace period of about 5 years on amortization payments, is appropriate for the proposed loan.

APPRAISAL OF THE  
BAYGORRIA HYDROELECTRIC PROJECT

U R U G U A Y

I. INTRODUCTION

This report covers the appraisal of a project consisting of a 103,000 kw hydroelectric plant on the Rio Negro, a high-tension transmission line about 340 kilometers long and the improvement of the primary distribution system in Montevideo. The project is estimated to cost the equivalent of \$52 million exclusive of interest during construction. The Bank has been requested to finance the foreign exchange cost of the project, estimated at \$25.5 million. The facilities included in the project would be owned and operated by UTE <sup>1/</sup>, an autonomous Government agency.

II. EXISTING BANK LOANS TO UTE

2. UTE, to which the Bank has previously made two loans totaling the equivalent of \$38.5 million, was established in 1912. It now supplies all electric power consumed by the public and almost all telephone service in Uruguay.

3. The first loan (Loan 30 UR), made in August, 1950, was for the equivalent of \$33 million. It was to provide for the foreign exchange costs of a program for the expansion of UTE's power and telephone systems, the total cost of which was estimated at the equivalent of \$46 million. The loan has now been completely disbursed and the project is complete except for a few minor items. The power part of the project included the expansion of UTE's thermal capacity in Montevideo by 50,000 kw, the addition of 18,000 kw of diesel capacity in the interior, the construction of 1,000 kilometers of high-tension transmission line, and the expansion of the primary and secondary transmission systems in Montevideo and the interior. The telephone program included the general expansion and improvement of the telephone system in Montevideo and the interior. Of the \$33 million Bank loan, \$26.8 million was expended for power and \$6.2 million for the telephones.

4. Both the power and telephone programs were completed about 20 months behind their original schedules. A part of this time was attributable to the 9 month delay in the ratification of the loan agreement and a part to the long delays in placing the original orders for many items. As a result, the program did not gain much momentum until 1952, but once under way the work proceeded at a reasonably satisfactory pace.

5. Partially because of the long delays described above, during which equipment prices and labor costs increased as a result of the Korean war and partially owing to the under-estimation of the local currency costs of the program, the final cost of the project exceeded the original estimates by the equivalent of \$2.6 million in foreign exchange and about \$17 million in local currency. These excess costs were met from UTE's own resources.

6. The second loan (Loan 132 UR), made in August, 1955, was for the equivalent of \$5.5 million to meet the foreign exchange cost of the

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<sup>1/</sup> Administracion General de las Usinas Electricas y Los Telefonos del Estado.

further expansion of UTE's thermal power plant capacity in Montevideo by 50,000 kw. The total cost of the project is estimated to be the equivalent of \$6.3 million. As at the end of July, 1956, the project was about 55% completed and \$2.36 million had been withdrawn from the loan. The project is scheduled to be completed in September, 1957.

7. Construction work under the second loan is progressing according to its original schedule. As such a large percentage of the work is covered by firm contracts, it is likely that the final cost of the project will be reasonably close to the original estimate.

### III. CAPACITY AND CONDITION OF UTE's GENERATING FACILITIES

#### Capacity

8. In July, 1956, UTE owned and operated power facilities with a total installed capacity of 285,500 kw and had 50,000 kw under construction, of which 20,000 kw was in partial operation. Of the capacity in operation, 145,000 kw is installed in two steam stations in Montevideo, 114,000 kw is in the Rincon del Bonete hydro station on the Rio Negro and 26,500 kw is in the 43 diesel plants in various parts of the country. The two steam stations in Montevideo (Batlle of 120,000 kw and Calchagno of 25,000 kw) and the Rincon del Bonete hydro plant, about 225 kilometers north of Montevideo, are connected by a high-tension transmission line. These interconnected stations are known as the Montevideo-Rincon System. This system serves Montevideo and also serves most of the other large and important communities in the country through an extensive transmission system, a large part of which was financed by the first Bank loan to Uruguay. (See map) This system in 1955 supplied about 91% of the electric energy consumed in Uruguay. The remaining 9% was supplied by the 43 diesel stations. Most of the diesel stations serve only one community, but a few serve nearby towns over relatively short transmission lines. Because of the expansion in UTE's transmission system, the amount of diesel generation is expected to decrease in the future to about 5 to 6% of the total and remain at about this level.

9. Under normal rainfall conditions the capacity of the Montevideo-Rincon system is 259,000 kw, but under drought conditions its capacity is only 223,000 kw. In 1955 the peak load on the system was 209,000 kw. Generation by the facilities in the Montevideo-Rincon system in 1955 amounted to 927.7 million kilowatt-hours, 678.4 million kwh of which was by the hydro plant and 249.3 million was by the thermal plants in Montevideo. Diesel plants in the interior generated 91.0 million kwh, bringing the total generation in 1955 by UTE's plants to 1,018.7 million kwh. Station use and transmission and distribution losses amounted to 23.8% of generation. These are within reasonable limits. (For details see Annex A)

#### Condition of Generating Facilities

10. The Rincon del Bonete hydro plant was completed in 1948 and is in good condition. Of the 100,000 kw in the Batlle steam plant, 50,000 kw, in two units, was completed in 1932 and is in reasonably good condition;

the other 50,000 kw, a single unit (partially financed by the first Bank loan), went into operation in February, 1955, and is in excellent condition. The 25,000 kw in the Calcagno steam plant, which consists of four generating units and 14 boilers installed at various times between 1906 and 1955, is obsolete and should be abandoned, but, because the demand for power has been so acute, it has been kept in usable condition as a reserve plant and is used from time to time. Although some of the old boilers have recently been replaced the plant uses 50% more fuel per kilowatt-hour and requires 4 to 5 times as much operating and maintenance labor as a modern plant. Most of the diesel plants which will remain in operation in the areas not served by transmission lines are fairly new and on the whole are in reasonably good condition.

#### IV. MARKET FOR ELECTRICITY

11. The principal market for electricity in Uruguay is in Montevideo, where about 1 million of the 2.52 million population live. It also contains most of the industry in Uruguay. In 1955 sales of electricity in Montevideo accounted for about 79% of the total sales in the country. The sales to various classes of consumers in Montevideo and in the Interior are shown in the following table.

CLASS OF CONSUMER MONTE-	VIDEO	%	INTERIOR	%	TOTAL	%
( t h o u s a n d s o f k i l o w a t t - h o u r s )						
Residential	211,255	34.5	61,787	37.8	273,042	35.2
Commercial	44,899	7.4	13,916	8.5	58,815	7.5
Industrial a/	316,793	51.8	58,103	35.7	374,896	48.4
Government	16,284	2.6	6,166	3.7	22,450	2.9
Municipal b/	19,630	3.2	7,765	4.7	27,395	3.5
Waterworks	3,383	0.5	15,684	9.6	19,067	2.5
TOTAL	612,244	100.0	163,421	100.0	775,665	100.0

a/Includes tramways in Montevideo.

b/Mostly street lighting.

12. Prior to the last world war sales of electricity in Uruguay had been increasing for several decades at about 8.4% a year. During the war there was a decrease in consumption because of rationing of power. After the war there was a considerable amount of expansion of existing industry and development of new industries, especially in the Interior. This, together with a steady increase in demand for residential and other uses, resulted in an increase in the postwar demand for electricity throughout the country, which exceeded the past annual rates of increase. From 1947 through 1955 UTE's total sales increased at an average rate of 9.7% a year. The increase in Montevideo averaged about 8.5% a year, but the increase in the interior was 16.2% per year. This reflects the increasing growth of industry in the interior where industrial power sales have more than doubled during the past six years. A still further development of industry in the interior



may be expected in the future as about 20 communities in the more populous and well-developed part of the country were connected in 1955 into the Montevideo-Rincon system by 110 kV transmission lines, known as the Eastern and Western circuits (partially financed by the Bank) with the result that these communities will now have an adequate and dependable power supply in place of the former inadequate supply from over-loaded diesel plants and can plan further industrial development with confidence.

13. UTE estimates that its sales during the period 1956-1962 will increase at a rate of 9.0% per annum. This is somewhat less than the average rate of increase in sales of 9.7% a year from 1947 to 1955 and is reasonable. On this basis, total sales are expected to increase from 773 million kwh in 1955 to 1,590 million kwh in 1963. For details see Annex A. For the first six months of 1956, sales have been 8.6% above a similar period in 1955. A serious strike reduced sales in April considerably. With normal sales in April, the increase over 1955 would have been above 9%.

14. The peak load on the Montevideo-Rincon system increased from 89,600 kw in 1947 to 209,000 kw in 1955, or at an average rate of about 11.4% per year. The peak load on the system (which will include some new communities) for 1956 is estimated at 230,000 kw, about 10% above 1955. UTE estimates that the peak load on the system after 1956 will increase at a rate of about 8.0% per year at least until 1962. By comparison with the 11.4% increase annually since 1947, this is conservative. At an average increase of 8.0% per year, the load on the system will reach about 364,000 kw in 1962 or about 74% above the 1955 load. For details see Annex B.

#### V. UTE'S CURRENT EXPANSION PROGRAM

15. To meet the increasing demands for power, UTE formulated in 1953 an expansion program which was approved by the Parliament. A part of this program, the installation of an additional 50,000 kw unit in the Batlle steam plant in Montevideo to bring its total capacity to 150,000 kw, is already under construction and is being partially financed by the Bank. The remainder of the program includes: construction of a 103,000 kw hydro plant on the Rio Negro at Baygorria, 88 kilometers downstream from the Rincon del Bonete hydro plant; additional high-tension transmission lines to interconnect the proposed Baygorria plant with Rincon del Bonete and Montevideo; the construction of a collector ring and substations in Montevideo to improve the connections between the various hydro and steam stations and the transmission lines radiating from Montevideo; construction of about 425 kilometers of new transmission lines of varying voltages to serve additional towns in the interior; the increase in the capacity of the Eastern and Western circuits, and the installation of additional diesel generating units in the Interior. In 1953 the program was estimated to cost the equivalent of \$79 million. The Bank was requested to finance the foreign exchange cost of the entire program, estimated at the equivalent of \$40 million.

16. The Bank management advised the Minister of Finance in December, 1953, that it was prepared in principle to recommend to the Executive Directors that the Bank participate in financing about \$30 million of the foreign exchange cost of the high priority items in the power expansion program

after the currencies required became known. The letter to the Minister of Finance suggested proceeding with loans to UTE in two or more tranches, the first to cover foreign exchange costs of expansion of the thermal plant in Montevideo for which the foreign currencies were partially known, and at a later date to undertake negotiations of additional loans when the currencies involved could be more accurately determined for the other high priority items. Accordingly, a loan to cover foreign exchange costs of the further expansion of the Batlle thermal plant in Montevideo was made in August, 1955, and construction is now in progress.

## VI. THE PROJECT

### Description

17. The project now proposed for Bank financing includes three of the higher priority items in UTE's expansion program and some business machines for its accounting departments. The items consist of:

A. The 103,000 kw hydro station 1/ on the Rio Negro at Rincon de Baygorria which will utilize the regulated flow from the large reservoir of the Rincon del Bonete hydro station 88 kilometers upstream. Storage in the Baygorria reservoir will be relatively small. The powerhouse, in which three generating units will be installed, will be an integral part of the dam. The average head on the turbines will be about 14.7 meters (48 feet). Provision will be made for the construction of a navigation lock at a future date. A road six meters wide will be constructed over the dam and powerhouse. (For further details see Annex C.)

B. The necessary high-tension transmission lines and substations to connect the Baygorria station with Rincon del Bonete and with Montevideo consisting of about 39 kilometers of single-circuit 161 kV lines to Bonete and 270 kilometers of double-circuit 161 kV lines to Montevideo, the expansion of the substation at Bonete and the construction of a new substation at Montevideo. (For further details see Annex D.)

C. The "Collector Ring" in Montevideo, consisting of about five kilometers of double-circuit underground cable, 28 kilometers of double-circuit 150 kV transmission lines and three substations. (For further details see Annex E.)

D. Business machines to modernize UTE's accounting department.

### International Character of the Rio Negro

18. The drainage area of the Rio Negro above the site of the proposed Baygorria Hydro plant is 37,725 square kilometers. Of this about 7% (2,680 square kilometers) lies in Brazil. The proposed Baygorria hydroelectric plant will be about 544 kilometers by river downstream from the Brazilian border and 88 kilometers below the existing Rincon del Bonete dam and reservoir which was completed in 1945. The Baygorria project, therefore, cannot affect any portion of the river which lies in Brazil. Any diversion of the

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1/ During droughts the capacity is estimated to be 83,000 kw.

relatively small flow of the Rio Negro in Brazil for irrigation or other purposes would have only a negligible effect on the operation of the Baygorria plant. There will be, therefore, no problems arising out of the international character of the Rio Negro involved in the construction of the Baygorria hydro station.

### Cost of the Project

19. The cost of the project outlined above is estimated at the equivalent of about \$52 million, excluding interest during construction. The foreign exchange cost is estimated at the equivalent of \$25.5 million, excluding interest during construction which is estimated at the equivalent of about \$4.41 million. The foreign exchange and local currency cost of the three items is given below.

<u>Item</u>	<u>Foreign Exchange</u> ( t h o u s a n d s U S	<u>Local Currency</u> d o l l a r s )	<u>Total Cost</u>
Baygorria Hydro Project	17,920	23,120	41,040
161 kV Transmission Lines	4,720	2,550	7,270
Collector Ring, Montevideo	2,560	890	3,450
Business Machines	<u>300</u>	<u>-</u>	<u>300</u>
Sub-total	25,500	26,560	52,060
Interest During Construction	<u>4,410</u>	<u>1,800</u> <sup>1/</sup>	<u>6,210</u>
TOTAL	<u>29,910</u>	<u>28,360</u>	<u>58,270</u>

20. After extensive international bidding, a contract for the construction of the Baygorria hydro project was awarded on May 29, 1956, to a consortium of European contractors and equipment suppliers. Contracts for the construction of the transmission lines and the collector ring have not yet been awarded,<sup>2/</sup> but bids have been received for the underground conductors and for the construction of overhead part of the collector ring. The estimated costs of the project include freight, maximum escalation, insurance and contingencies. Contingencies of about 10% are included in the estimate of the foreign exchange costs and about 14% in the local currency costs. In view of the fact that a contract has been awarded for the largest of the three items and the cost of a part of the other items are known, the amounts included for contingencies should be sufficient, especially since the contracts contain a ceiling (10%) on the escalation on equipment items. The cost per kilowatt installed is estimated to be the equivalent of about \$446, including interest during construction. This is on the high side,

<sup>1/</sup> Does not include interest on funds from own resources.

<sup>2/</sup> UTE is required by law to obtain competitive bids on all major purchases or contracts. It is the policy of UTE to obtain international bids in such cases.

but it is an acceptable figure for a low head plant. The estimates on the transmission lines and the collector ring are also reasonable.

21. Supervision of the construction of the project will be undertaken by UTE's engineering staff assisted by a well-qualified firm of Swiss consulting engineers, Gruner Brothers and Associates.

22. Other items in UTE's expansion program, estimated to cost the equivalent of about \$9.6 million will be financed from UTE's own resources. (See paragraph 15.). However, it is probable that some of these items will be postponed until after the completion of the Baygorria project. Concurrently with the construction of the project, UTE will continue to expand its distribution facilities in Montevideo and in the interior from its own resources. As will be seen in Paragraph 37 and in Annex J, UTE will have ample funds for this purpose.

#### Schedule of Construction

23. Contractors started the construction of the Baygorria hydro plant during August, 1956. UTE had previously completed the construction of a paved access road about 40 kilometers long from the railroad to the dam site, and a water supply and sewerage system, a small power plant, and a considerable amount of housing at the dam site. The following table gives dates for starting construction and the estimated dates for final acceptance or completion of each item included in the project.

<u>Item</u>	<u>Starting Date</u>	<u>Final Acceptance Date</u>
<u>Baygorria Hydro Plant</u>		
A. First Unit	August 1956	June, 1960
B. Second Unit	August, 1956	October, 1960
C. Third Unit	August, 1956	March, 1961
		<u>Completion Date</u>
<u>Transmission Lines</u>		
A. Bonete-Baygorria	January, 1957	May, 1959
B. Baygorria-Montevideo	September, 1957	September, 1960
<u>Collector Ring</u>	June, 1956	December, 1958

24. The above schedules are reasonable. It is possible that the Baygorria hydro plant can be completed somewhat under the time estimates, provided no unusual floods occur on the Rio Negro, particularly in view of the fact that the specifications provide for a premium to be paid to the contractors for completion of the first unit ahead of the allotted time and also penalties for delays in the completion of all three units. The contractor's plan for the construction has been reviewed by three independent consultants 1/ and deemed satisfactory.

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1/ Dr. A. Ludin of Germany, Mr. Andre Pfaff of Electricite de France, and Mr. Grant Bloodgood, U. S. Bureau of Reclamation.

### Engineering Aspects

25. The original design, the preliminary plans and specifications were prepared under the direction of Dr. Adolph Ludin, an independent consultant from Germany, who designed the Rincon del Bonete hydro plant. The preliminary plans were reviewed by Mr. W. L. Newmeyer, an engineer of the U. S. Bureau of Reclamation who concluded that the plans were sound. The contractors will prepare the detailed working drawings which will be checked and approved by UTE and its consultants. The contractors will supply all necessary construction equipment.

26. The geological conditions at the dam site at Rincon de Baygorria are satisfactory. The spillway capacity of the dam is adequate. The computations of the flow available at Baygorria are based on 40 years of hydrological records. <sup>1/</sup> In general, the design and layout of the plant are engineeringly sound and the plant should have a reasonably high operating efficiency. Under average rainfall conditions (1,115 mm or 43.5 inches annually) the plant is estimated to produce about 450 million kilowatt-hours annually. This is based on a 51% load factor and is a reasonable assumption.

27. The design of the transmission lines is similar to that of the existing line from Rincon del Bonete to Montevideo. They will be adequate for the estimated loads which they are expected to carry.

28. The design of the collector ring is technically sound. It should increase the efficiency of the distribution of energy in Montevideo and to the Eastern and Western circuits out of Montevideo.

### Rate of Foreign Exchange Expenditures

29. The estimated rate of foreign expenditures on the project is shown in the following table expressed in millions of U. S. Dollars.

<u>Item</u>	<u>1956</u>	<u>1957</u>	<u>1958</u>	<u>1959</u>	<u>1960</u>	<u>1961</u>	<u>Total</u>
Baygorria	2.08	4.31	6.31	3.73	1.29	.20	17.92
Transmission	-	.11	2.01	1.92	.49	.19	4.72
Collector Ring	-	1.29	1.17	.10	-	-	2.56
Business Machines	-	.30	-	-	-	-	.30
TOTAL	2.08	6.01	9.49	5.75	1.78	.39	25.50

### VII. ORGANIZATION AND MANAGEMENT OF UTE

30. UTE is administered by a Board of five directors. Three members of the Board, including the President, are appointed from the majority party in the Parliament and two are appointed from the minority party. Under the President there are managers of power, telephones, administration, and finance. UTE's staff numbers about 11,000. Of the total, about 5,400 are in the power division, 3,000 in the telephone division, and 2,600 in the administrative and financial divisions. This staff is too large

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<sup>1/</sup> The average annual flow at Baygorria, 14.65 million acre feet, is about the same as the annual original flow on the lower Colorado River in the United States at the Hoover Dam.

by normal standards, but as UTE's office employees, as well as all Government office employees in Uruguay, work only five hours a day, the excess staff is required to carry on operations at a reasonable pace, although non-office workers have a seven-hour day. UTE's administrative procedures are rather cumbersome, but this is largely because of necessity for compliance with Government regulations. The Board of Directors generally changes after each national election. In spite of this rather frequent turnover (every four years) UTE is reasonably well managed, as the senior permanent officials are conscientious and hard-working and supply the continuity required for the day to day operations.

31. UTE's engineering staff for planning and supervision of construction is relatively small and it is fairly well occupied with construction work in progress. However, it will be supplemented by the staff of experienced consulting engineers during the construction of the project. The contractors will therefore be adequately supervised.

#### VIII. FINANCIAL ASPECTS

##### Rate Structure and Earnings

32. Although the cost of production of electric energy in Diesel stations in the interior is about twice the average cost of energy produced in the large thermal and hydro stations in the Montevideo-Rincon system, UTE's charges for energy apply uniformly throughout the country regardless of the source of the energy sold. In the past, this practice has resulted in net losses in the interior owing to the large proportion of generation by diesel plants in the interior prior to the completion of the Eastern and Western circuits. However, as revenues from sales in Montevideo have more than offset the losses in the interior, UTE has shown a net profit every year in the past ten years, except in 1951 when a small deficit (500,000 pesos) was recorded. (For details see Annexes F and G.) At the end of that year UTE increased its industrial tariffs about 40% and its residential tariffs about 32% and in the following year the small deficit changed to a substantial net profit and since then profits have been very satisfactory. The 1951 tariffs remained in effect until September, 1955, when UTE again was authorized to increase its power and telephone rates.<sup>1/</sup> These increases averaged about 14% for industrial consumers, about 5.5% for commercial customers, about 10% for residential consumers, 25% for tramways, and averaged overall about 13%. Increases in the telephone tariffs averaged about 25%. Now that the high-tension transmission lines comprising the Eastern and Western circuits have been completed, the amount of energy to be generated by the diesel plants in the future is estimated to be only 5 to 6% of the total generation. Since the interior, which is estimated to consume from 24 to 28% of UTE's total production, will be supplied largely from the Montevideo-Rincon system, the revenues from sales in the interior under the uniform tariff policy should in the future cover UTE's average cost of production.

33. It is estimated that in 1956, the first full year the new tariffs will have been in effect, UTE's return on its investment will be about 10%

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<sup>1/</sup> UTE's tariffs can be changed with the approval of the Executive Council. No parliamentary approval is required.

and, after the completion of the project, the return should increase to about 11%.

### Present Financial Position

34. The present financial position of UTE is satisfactory. The condensed balance sheets as at the end of 1953, 1954, and 1955, compiled from data supplied by UTE, are given in Annex H. The 1955 balance sheet showed total long-term debt of 168.1 million pesos. Of this amount about 83.1 million pesos represented the balance of the debt incurred by the RIONE, the Government agency which constructed the hydroelectric plant at Rincon del Bonete. When this agency was merged with UTE in 1950, the Government assumed one-third of the debt-service on the RIONE obligations. This can be considered as an equity contribution by the Government to UTE. The balance of UTE's long-term debt, with the exception of the two IBRD loans is represented by bond issues which are direct obligations of the Government. UTE has an obligation to reimburse the Government for the service of this debt.

35. UTE's net long-term debt at the end of 1955, after deducting one-third of the RIONE debt, was about 140 million pesos and its equity capital was 138.9 million pesos, a debt/equity ratio of about 50:50. UTE's equity capital, with the exception of the part of the RIONE debt assumed by the Government, consists mostly of retained earnings. Increases in UTE's equity capital will probably be limited to retained earnings which are likely to be substantial in the forthcoming years. UTE's capital structure at the end of 1955 is summarized below:

### CAPITAL STRUCTURE AS OF DEC. 31, 1955

	<u>Millions of Pesos</u>		<u>Per Cent</u>
Long Term Debt	168.1		
Less: Amount of RIONE debt to be serviced by Government	<u>27.7</u>	140.4	50.0
<u>Government Equity</u>			
Reserves and Surplus	111.2		
RIONE debt to be serviced by Government	<u>27.7</u>	<u>138.9</u>	<u>50.0</u>
TOTAL	<u>279.3</u>		<u>100.0</u>

36. As at the end of 1955 current assets of 56.1 million pesos were only slightly in excess of current liabilities of 54.1 million pesos. However, 28.8 million pesos of this latter amount, or more than half of total current liabilities, were owed to the Government. This sum represented accumulated debt service payments made by the Government on account of UTE's funded debt during the last five years. The Government has not required UTE to settle this obligation in cash, permitting UTE to use the funds to finance part of the local currency costs of its construction program. This procedure will probably be continued in the future. There is no risk that on this account UTE at some future date would be faced with a liquidity problem, because the Government has agreed to defer the collection of debt

service owing by UTE if funds are needed to carry out its present expansion program or to meet any of its other obligations. The Government has further agreed that any deferred payments would be funded on a long-term basis or would be capitalized from time to time.

Method of Financing UTE's Expansion Program

37. UTE estimates that during the period 1956/1961 it will have to invest in construction 263.6 million pesos (\$125.5 million). This figure consists of the following items:

	Estimated Construction Requirements 1956/1961 (in millions of pesos)
A. Proposed IBRD Project (Baygorria, Transmission Lines, Collector Ring, Etc.)	119.1 <u>1/</u>
B. Expenditures Required to Complete Previous Bank Projects:	
(i) Power and Telephone Program - Loan No. 30	3.5
(ii) Second Unit Steam Plant Montevideo - Loan No. 132	<u>9.4</u>
Sub-Total Existing and Proposed Bank Projects	132.0
C. Other New Power Projects	19.6
D. Telephone Construction Program	36.8
E. Other Construction (renewals, extension of distribution system, etc.)	<u>76.3</u>
Sub-Total Other Construction Work	<u>132.7</u>
TOTAL REQUIREMENTS 1956/1961	264.7

38. UTE has requested that a loan of \$25.5 million equivalent (53.55 million pesos) be made to cover the foreign exchange expenditures of the project now under consideration, listed under item "A" in the above table. This would finance about 43.8% of the cost of the project. The local currency cost to complete the projects partially financed by the Bank, as well as the local cost of the non-Bank-financed part of the construction program, estimated to total 197.4 million pesos, would be mainly financed from UTE's own resources and to a small extent by the issue of local currency bonds. UTE's financing plan for the entire program may be summarized as follows:

1/ Expenditures prior to 1956 amounted to 3.18 million pesos.



Millions of Pesos

A. Borrowing:

1) Proposed IBRD loan for Baygorria, Transmission Line, and Collector Ring, Etc.	53.6
2) Balances Available in Previous IBRD loan? for the Projects Listed under B (i) and B (ii) in the Above Table as at January 1, 1956:	
(a) Loan No. 30	\$1.04
(b) Loan No. 132	<u>5.50</u>
	\$6.54
	13.7
3) Proceeds from local bonds to be issued	16.7
TOTAL FROM BORROWING	84.0

B. Own Resources (retained profits, depreciation allowances 1956/1961)	<u>180.7</u>
TOTAL COST OF PROGRAM	264.7

39. According to the above summary, UTE would be able to finance about 68% of the total construction expenditures for the six-year period 1956/1961 from its own resources. Only 32% of total requirements would be raised from borrowing. This plan of financing the program is considered realistic. The large amount of self-financing contemplated will be possible because of the substantial increase in revenues resulting from increases in rates obtained by UTE last year and UTE's plan to continue to invest all net profits during the period in the program. The Government has expressed its willingness for UTE to so invest its profits.

Forecast of Future Earnings and Cash Flow

40. The financial forecasts presented in this report are not limited to the project for which a loan is now proposed, but comprise the entire construction program for the period 1956-1961, as indicated in paragraph 37. The forecast of operating results for the period 1956-1962 is given in Annex I. The estimates of gross revenues in this forecast are based on UTE's estimates which assume an average rate of growth in sales of 9% annually. On this basis, which is considered reasonable, the net earnings of UTE over the period will be satisfactory. In each year during the period interest charges would be covered by a wide margin by net income from operations. Such coverage would increase from 4.8 times in 1956 to 7.5 times in 1962. The forecast of the cash position shown in Annex J assumes that all net profits would be retained by UTE for investment in the construction program. By the end of 1960 UTE, according to the cash flow forecast, would start accumulating substantial cash balances. In actual practice this is unlikely to occur, because it may be assumed that by that time UTE will have to start investing in additional power facilities, beyond the present program.

Pro Forma Balance Sheet

41. UTE's future financial position after completion of the project in the first half of 1961 is shown in the pro forma balance sheet given in Annex K. At that time UTE's capital structure is expected to be as follows:

	<u>Millions of</u> <u>Pesos</u>	<u>Per</u> <u>Cent</u>
<u>Long-Term Debts</u> <sup>1/</sup>	229.1	
Less: 1/3 part of RIONE debt outstanding for account of Government	<u>21.8</u>	
Net Debt for Account of UTE	207.3	39.6
<u>Government Equity</u>		
Reserves and Surplus	294.6	
add: 1/3 RIONE debt for account of Government	<u>21.8</u>	
	<u>316.4</u>	<u>60.4</u>
TOTAL	<u>523.7</u>	<u>100.0</u>

42. This is certainly a satisfactory position. The decrease in the debt/equity ratio from 50:50 in January, 1956, to the estimated ratio of 40:60 by the end of the construction period reflects the large increase in the equity of 177.5 million pesos as compared with an estimated net increase in long-term debt of only 66.9 million pesos. About 157 million of the increase in the equity is represented by retained net profits and the balance of 20 million by an exchange profit to be recorded on UTE's foreign debt.<sup>2/</sup>

Debt-Service Coverage

43. Annual debt service, including amortization, on the proposed IBRD loan of \$25.5 million, would amount to \$2,003,000 on the assumption that the loan would have a term of 25 years including 5 years of grace, and an interest rate of 5% per annum.

<sup>1/</sup> For the purpose of this calculation, it has been assumed that about 47 million pesos of debts, owing by UTE as of the end of 1955 (a) to the Government for accumulated debt service, and (b) to the Government and various Government agencies for certain deferred obligations, will have been converted into long-term debt by 1961.

<sup>2/</sup> The goods to be purchased with the proposed IBRD loan will be recorded by UTE at the rate of 2.1 pesos to \$1.00, which is the current rate applying to imports. Debt-service, however, will be made at a rate equivalent to 1.519 pesos to the \$1.00, being the official rate applying to debt-service payments for Government debts. The difference represents a foreign exchange profit. (See also Note 3 to Annex E.)

44. Total annual debt-service on all debt (existing and proposed) would amount to approximately 19.5 million pesos (\$9.1 million) in the immediate years after completion of the program and would be covered by receipts from operations (before deduction of depreciation and interest) about four times. This ratio will increase gradually in later years, as debt is amortized.

#### Security

45. Except for a 2.5 million peso industrial mortgage (prenda) outstanding against some of its equipment, none of UTE's properties are mortgaged nor are there any assignments of UTE's revenues. Since the amount of the mortgage is relatively small, no positive security is considered necessary for the proposed loan, but there will be the usual negative pledge.

### IX. ECONOMIC JUSTIFICATION

46. Uruguay has no indigenous fuels available in commercial quantities; consequently, all fuel for the operation of UTE's steam power stations must be imported. At present oil is the cheapest fuel for these stations. Oil consumed by these plants in 1955 cost the equivalent of about \$2.35 million. In consuming this amount of oil the steam plants produced about 27% of the total generation of the Montevideo-Rincon system. This was slightly above the average amount of generation by steam for the past five years which was 23% of the total. In 1963, the production of the Montevideo-Rincon system is estimated at 1,760 million kwh. Of this about 451 million kwh (about 25%) are expected to be generated by the Baygorria hydro plant. To generate 451 million kilowatt hours of electricity in a modern thermal plant, the fuel cost would be about \$3.2 million. This would amount to about 15% of the value of crude petroleum imports in 1955 and about 1.4% of Uruguay's total imports in 1955. These figures illustrate the order of magnitude of the importance of the Baygorria plant to Uruguay's balance of payments.

47. Assuming a 6.2% return (present cost to UTE of borrowing in the Montevideo market) on the entire investment, the cost of production of electricity by the Baygorria plant is estimated to be 8.8 mills (1.85 centisimos) per kilowatt hour at the bus bar. Delivered in Montevideo, including 8% transmission losses, the energy is expected to cost about 1 cent (2.1 centisimos) per kwh. Energy generated in Montevideo in a steam plant comparable to the capacity of the Baygorria Hydro plant and paying the same price for fuel as UTE would cost about 25 to 30% more than energy from Baygorria.

48. The project is therefore justified not only on the basis of lower cost of production compared with steam generation, but also on the potential savings in imports of fuel oil which weigh heavily on the debit side of the balance of payments.

X. CONCLUSIONS AND RECOMMENDATIONS

49. The project is urgently needed to meet the demand for power in Uruguay and it is economically justified. It has been thoroughly studied and the estimated costs are reasonable. UTE's plans for financing the project are satisfactory.

50. UTE's organization, supplemented by consultants, will be capable of supervising the construction of the project and its management will be capable of operating the project after its completion.

51. UTE should be the borrower. Its present financial position is sound and its present rate structure should provide an adequate return on its investment in the foreseeable future.

52. The project is suitable as a basis for a loan of the equivalent of \$25.5 million. A term of 25 years, including a grace period of five years on amortization payments, is appropriate for the proposed loan.

ANNEX AGENERATION IN UTE'S PLANTS 1948-1955  
( m i l l i o n s o f k w h )

<u>Year</u>	<u>Steam</u>	<u>%</u>	<u>Hydro</u>	<u>%</u>	<u>Diesel</u>	<u>%</u>	<u>Total Generation</u>	<u>Tot. Sal.</u>
1948	79.8	15.1	396.1	74.7	54.1	10.2	530.0	421
1949	25.9	4.5	486.4	84.8	61.5	10.7	573.8	451
1950	20.0	3.2	526.9	85.6	68.8	11.2	615.7	490
1951	200.4	29.4	400.4	58.8	80.8	11.8	681.6	543
1952	137.3	18.2	523.2	69.6	92.5	12.2	753.0	592
1953	144.8	17.1	600.8	71.1	99.2	11.8	844.8	655
1954	142.1	15.4	676.7	73.0	107.7	11.6	926.5	704
1955	249.3	24.5	678.4	66.6	91.0	8.9	1,018.9	775

ESTIMATED GENERATION & SALES 1956-1963  
( m i l l i o n s o f k w h )

<u>Year</u>	<u>Montevideo-Rincon System</u>	<u>%</u>	<u>Diesel</u>	<u>%</u>	<u>Total Generation</u>	<u>Total Sales</u>
1956	1031	94.0	65	6.0	1096	849
1957	1113	95.2	56	4.8	1169	928
1958	1201	95.0	63	5.0	1264	1,016
1959	1300	94.9	70	5.1	1370	1,111
1960	1400	94.7	78	5.3	1478	1,217
1961	1510	94.5	88	5.5	1598	1,332
1962	1630	94.3	99	5.7	1729	1,460
1963	1760	94.1	110	5.9	1870	1,590

ANNEX B

PEAK LOAD ON MONTEVIDEO-RINCON SYSTEM 1947-1955

<u>Year</u>	<u>60 Minute Peak Load (kw)</u>	<u>% Increase Over Previous Year</u>
1947	89,600	- -
1948	98,700	10.2
1949	102,500	3.9
1950	114,300	11.5
1951	123,500	8.0
1952	132,200	7.0
1953	152,500	15.3
1954	162,500	6.5
1955	209,000	28.6

ESTIMATED PEAK LOAD ON MONTEVIDEO-RINCON SYSTEM 1956-1963 and CAPACITY AVAILABLE

<u>Year</u>	<u>Estimated Peak Load (kw)</u>	<u>Capacity of System</u>	
		<u>Normal Rainfall</u>	<u>Drought Period</u>
1956	230,000	259,000	223,000
1957	248,000	289,000	253,000
1958	268,000	289,000	253,000
1959	289,000	289,000	253,000
1960	312,000	392,000	336,000
1961	337,000	392,000	336,000
1962	364,000	392,000	336,000
1963	393,000	392,000	336,000

From the above it will be noted that the capacity of the system under drought conditions will be exceeded in 1961 and under normal rainfall conditions in 1963.

BAYGORRIA HYDROELECTRIC PLANTLocation

On Rio Negro about 88 km downstream by river from the Rincon del Bonete hydro plant and reservoir at the downstream end of an ox-bow bend (Rincon) in the river.

General Description

A low-head plant to be operated with a partially regulated flow primarily from storage at Rincon del Bonete hydro plant. The power house on the left bank will be an integral part of the dam. A roadway 6 meters wide will cross the dam and power house. Two small earth dykes will be constructed in saddles on the right bank. Provision will be made for a lock on the right bank.

The Dam

The dam, which will be on fairly good rock, will be a gravity type; its width including the power house will be 490 meters; its spillway, which will have a capacity of 9,000 cubic meters per second, will be 129 meters wide. Crest gates on the spillway section will control the flow over the dam. A gantry crane will travel the length of the dam and powerhouse.

Rainfall and Run-Off

The annual rainfall is 1,115 mm (43.5 in.). It is fairly evenly distributed, with no well-defined wet or dry seasons. Stream flow records are available for over forty years. The actual flows at Baygorria will be influenced by the Bonete reservoir, which has a maximum usable storage capacity of 6,500 million cubic meters (about 5,300,000 acre-feet). Based on flow records prior to construction of the Rincon del Bonete Dam, the natural flows at Baygorria would be:

Minimum flow. . . . .	22 cubic meters per second
Average flow. . . . .	572 cubic meters per second
Maximum recorded. . . . .	5,400 cubic meters per second
Design flood. . . . .	9,000 cubic meters per second

The design flood is expected to occur once in 1,000 years.

Reservoir

The Baygorria reservoir will have a usable storage capacity of about 120 million cubic meters (about 100,000 acre feet).

Heads on Turbines

	<u>Upper Pool Level</u>
	<u>Meters A. S. L.</u>
Average.....14.7 meters (48.1 feet)	54.0
Maximum.....16.0 meters (52.5 feet)	55.0
Minimum.....10.0 meters (33.0 feet)	53.5

These figures are based on the assumption that the Paso del Puerto hydro plant will be constructed downstream and take into account the backwater effect from that plant.

Turbines

Three Kaplan type:

Maximum Draft at Average Head. . . . . 270 cu. m/sec. (9,600 cfs)  
 Capacity at average head and  
 maximum draft. . . . . 47,000 HP  
 Speed. . . . . 79 RPM

Generators

Three, air-cooled, three-phase, 50 cycle, 36,000 kVa (34,200 kw @ 95 PF)

Capacity of PlantAt Plant

At Average Head. . . . . 103,000 KW  
 Flood Periods. . . . . 67,600 KW\*  
 Drought Periods. . . . . 83,000 KW

\*About three days a year on the average

Estimated Production

450,000,000 kwh annually at 51% load factor

Estimated Cost

Item	Foreign	Local	Total
	Exchange	Currency	Cost
	(Thousands of US Dollars)		
Civil Engineering Works (1)	7,860	11,640	19,500
Turbines	2,810	260	3,070
Gates, Cranes, Etc.	2,310	210	2,520
Electrical Equipment	860	170	1,030
Spare Parts	900	--	900
Land	--	2,380	2,380
Access Road (Completed)	--	1,760	1,760
Housing (permanent)	--	950	950
Other Direct Costs	--	950	950
Administrative Expenses	--	1,430	1,430
Engineering Expense	950	480	1,430
Escalation in Contracts	600	--	600
Contingencies (1)	1,630	2,890	4,520
TOTAL	17,920	23,120	41,040

(1) Amount for construction equipment fixed in contract at 7.2 million pesos.  
 Contingencies in civil works computed after deducting this amount.

Cost of Production

The cost of production at the bus bar during an average rainfall year, exclusive of interest on borrowed funds or a return on equity capital, is estimated at 2.72 mills per kwh (.57 centavos). With an assumed return on the total investment of 6.2%, the cost of production would be 8.8 mills per kwh (1.84 centavos). Delivered at Montevideo, including the cost of transmission, the cost per kwh is estimated to be 10.4 mills (2.1 centavos).



	<u>Foreign</u> <u>Exchange</u>	<u>Local</u> <u>Currency</u>	<u>Total</u> <u>Cost</u>
	(Thousands of U. S. Dollars)		
Baygorria-Bonete	340	200	540
Baygorria-Montevideo	3,770	2,060	5,830
Substations	<u>610</u>	<u>290</u>	<u>900</u>
TOTAL	<u>4,720</u>	<u>2,550</u>	<u>7,270</u>

MONTEVIDEO 150 KV COLLECTOR RINGGeneral Description

The Montevideo 150 kV collector ring will consist of a double circuit transmission line extending 33 kilometers from a substation (E) near the Batlle steam station in Montevideo westward in a semi-circle around the suburbs of Montevideo to a substation (A) on the northern outskirts of the city. The circuits will consist of underground cable for the first five kilometers and for the next 28 kilometers of a double-circuit overhead line strung on single steel towers. Three new substations will be constructed.

The ring will provide a better interconnection between the steam stations in Montevideo and existing and proposed hydro plants on the Rio Negro and the Eastern and Western circuits radiating from Montevideo.

Estimated Cost (including 10% contingencies)

	<u>Foreign</u> <u>Exchange</u>	<u>Local</u> <u>Currency</u> (Thousands US Dollars)	<u>Total</u> <u>Cost</u>
Substations	1,143	316	1,459
Underground Cable	613	143	756
Overhead Lines	679	310	989
Other Costs	<u>125</u>	<u>121</u>	<u>256</u>
TOTAL	<u>2,560</u>	<u>890</u>	<u>3,450</u>

UTE  
SIGNIFICANT EARNINGS FIGURES  
YEARS 1946-1955  
(All Peso Figures in Millions)

<u>Year</u>	<u>Gross Reven- ues</u>	<u>Net Operating Income 1/</u>	<u>Legal Contri- butions</u>	<u>Available for Interest Charges</u>	<u>Interest Charges</u>	<u>Times Interest Earned</u>	<u>Workers' Bonuses</u>	<u>Net Profit Available for Reserves etc.</u>
1946	26.1	5.2	0.5	4.7	0.7	6.6	0.8	3.2
1947	27.1	2.7	0.5	2.2	0.7	3.0	0.9	0.6
1948	32.5	2.9	1.1	1.8	1.0	1.8	0.6	0.3
1949	40.5	4.5	1.1	3.3	0.9	3.6	1.4	1.0
1950	44.8	8.4	1.1	7.3	3.9	1.9	1.7	1.7
1951	51.3	7.4	1.1	6.3	4.9	1.3	1.9	d 0.5
1952	70.4	19.6	1.1	18.5	4.9	3.8	2.2	11.4
1953	76.5	20.8	1.1	19.6	4.9	4.1	2.4	12.4
1954	83.8	23.0	1.1	21.8	4.9	4.5	2.4	14.6
1955	97.9	22.8	1.1	22.7	4.7	4.8	3.5	13.4

Note: Figures do not necessarily add to totals due to rounding.

d = deficit

1/ After depreciation charges

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COMMENTS:

The sharp increase in 1952 in gross revenues and net profit was the result of rate increases obtained at the end of 1951. New rate increases were also obtained during the latter part of 1955. The higher revenues resulting from these increases during only part of the year were fully absorbed by retroactive increases in salaries and wages. The year 1956, therefore, will be the first year showing the full effect of the 1955 rate increases.

UTE CONDENSED INCOME STATEMENTS  
( i n m i l l i o n s o f p e s o s )

	<u>1951</u>	<u>1952</u>	<u>1953</u>	<u>1954</u>	<u>1955</u>
<u>Electric Power</u>					
Gross Revenues	41.05	56.90	62.12	67.44	77.22
Operating Expenses	30.90	33.89	37.39	40.32	50.47
Depreciation	<u>2.93</u>	<u>4.57</u>	<u>5.09</u>	<u>5.87</u>	<u>6.45</u>
Net Operating Income	7.22	18.44	19.64	21.25	20.30
<u>Telephones</u>					
Gross Revenues	10.20	13.47	14.39	16.37	20.65
Operating Expenses	9.34	10.98	11.91	13.20	16.72
Depreciation	<u>.64</u>	<u>1.30</u>	<u>1.33</u>	<u>1.43</u>	<u>1.46</u>
Net Operating Income	.22	1.19	1.15	1.74	2.47
<u>Totals (Power and Telephones)</u>					
Gross Revenues	51.25	70.37	76.51	83.81	97.87
Operating Expenses	40.24	44.87	49.30	53.52	67.19
Depreciation	<u>3.57</u>	<u>5.87</u>	<u>6.42</u>	<u>7.30</u>	<u>7.91</u>
Net Operating Income	7.44	19.63	20.79	22.99	22.77
Less: Legal Contributions	<u>1.14</u>	<u>1.14</u>	<u>1.14</u>	<u>1.14</u>	<u>1.14</u>
Available for Interest Charges	6.30	18.49	19.65	21.85	21.63
Less: Interest Charges	<u>4.87</u>	<u>4.90</u>	<u>4.85</u>	<u>4.83</u>	<u>4.73</u>
Net Income	1.43	13.59	14.80	17.02	16.90
Workers' Bonuses	<u>1.94</u>	<u>2.21</u>	<u>2.41</u>	<u>2.44</u>	<u>3.49</u>
<u>Net Profit</u>	d .49	11.38	12.39	14.58	13.41
% Electric Power Revenues of Total Revenues	80.1	80.9	81.2	80.5	79.0
% Electric Power Division					
Net Operating Income of					
Total Net Operating Income	97.0	93.9	94.5	92.4	89.0

d = deficit

UTE CONDENSED BALANCE SHEETS  
(in Millions of Pesos)

<u>As of December 31</u>	<u>1953</u>	<u>1954</u>	<u>1955</u>
<u>ASSETS</u>			
Fixed Assets (net book value) and construction in progress, including advance payments	211.0	249.7	275.1
Current Assets:			
Cash	4.6	1.7	3.6
Inventories	24.5	28.3	23.6
Accounts Receivable, etc.	<u>20.9</u>	<u>24.1</u>	<u>29.3</u>
	50.0	54.1	56.5
Government Accounts Receivable (deferred) <u>2/</u>	6.7	6.7	6.7
Other (bond discounts, etc.)	<u>12.7</u>	<u>14.5</u>	<u>14.3</u>
TOTAL ASSETS	<u>280.4</u>	<u>325.0</u>	<u>352.6</u>
<u>LIABILITIES AND EQUITY</u>			
Long-Term Debts <u>3/ 4/</u>	155.9	167.3	168.1
Current Liabilities:			
Accounts Payable, Due to Banks, etc.	11.3	17.0	20.9
Due to Government for Debt Service	14.5	21.7	28.8
Unpaid Legal Contributions	<u>2.6</u>	<u>3.4</u>	<u>4.4</u>
	28.4	42.1	54.1
Government Accounts Payable - deferred <u>2/</u>	18.1	18.1	18.1
Other	1.1	1.0	1.1
Equity (Reserves and Surplus)	<u>76.9</u>	<u>96.5</u>	<u>111.2</u>
TOTAL LIABILITIES AND EQUITY	<u>280.4</u>	<u>325.0</u>	<u>352.6</u>
Net Current Assets	22.6	12.0	2.4
Current Ratio	1.8:1	1.3:1	1.04:1

1/Provisional figures based on Trial Balance.

2/Payment of these accounts was deferred by Government decree. After the completion of UTE's expansion program they will probably be offset and the remaining balances paid off over a number of years.

3/Includes external debt, which as of December 31, 1955, amounted to about \$38.3 million, of which \$30.3 million represented the outstanding balance of the IBRD loan No. 30 UR, and \$8 million the balance of an Export-Import Bank loan. The IBRD loan is recorded on the books at the rate of 1.519 pesos per dollar, whereas the Export-Import Bank loan is recorded at 1.90 pesos per dollar. The rate of 1.90 is the rate which applied to the imports purchased with the proceeds of these loans. However, debt service payments (principal and interest) are made at the official rate of 1.51 pesos established for the service of external Government debt. The difference of .381 pesos represents a book profit, which is transferred directly to Reserves and does not appear in UTE's income statements.

4/Includes obligations of RIONE, the Government agency which constructed the hydro plant at Rincon del Bonete and which was absorbed by UTE in 1950. UTE carries the full amount of these obligations (83.1 million pesos as of December 31, 1955) on its books, although by law one-third of the service requirements are paid by the National Treasury.

UTE FORECAST OF OPERATING RESULTS - 1956-1962  
(in millions of Pesos)

ANNEX I

	<u>1956</u>	<u>1957</u>	<u>1958</u>	<u>1959</u>	<u>1960</u>	<u>1961</u>	<u>1962</u>
<u>Electric Power</u>							
Gross Revenues <sup>1/</sup>	90.97	99.18	108.09	117.80	128.37	139.89	152.51
Operating Expenses	53.13	58.71	63.23	70.35	67.70 <sup>2/</sup>	75.69	81.05
Depreciation	10.07	10.46	11.34	12.46	16.43	17.13	17.63
Net Operating Income	<u>27.77</u>	<u>30.01</u>	<u>33.52</u>	<u>34.99</u>	<u>44.24</u>	<u>47.07</u>	<u>53.83</u>
<u>Telephone</u>							
Gross Revenues <sup>3/</sup>	24.33	26.52	28.91	31.50	34.33	37.41	40.79
Operating Expenses	17.96	19.63	20.70	22.65	23.90	26.19	27.64
Depreciation	2.19	2.19	2.19	2.72	2.94	3.19	3.48
Net Operating Income	<u>4.18</u>	<u>4.70</u>	<u>6.02</u>	<u>6.13</u>	<u>7.49</u>	<u>8.03</u>	<u>9.67</u>
<u>Totals (Power and Telephones)</u>							
Gross Revenues	115.30	125.70	137.00	149.30	162.70	177.30	193.30
Operating Expenses	71.09	78.34	83.93	93.00	91.60	101.88	108.69
Depreciation	12.26	12.65	13.53	15.18	19.37	20.32	21.11
Net Operating Income	<u>31.95</u>	<u>34.71</u>	<u>39.54</u>	<u>41.12</u>	<u>51.73</u>	<u>55.10</u>	<u>63.50</u>
Less: Legal Contributions	1.26	1.26	1.26	1.26	1.26	1.26	1.26
Available for Interest Charges	<u>30.69</u>	<u>33.45</u>	<u>38.28</u>	<u>39.86</u>	<u>50.47</u>	<u>53.84</u>	<u>62.24</u>
Less: Interest	6.46	6.23	6.38	6.27	8.68	8.55	8.28
Net Income	<u>24.23</u>	<u>27.22</u>	<u>31.90</u>	<u>33.59</u>	<u>41.79</u>	<u>45.29</u>	<u>53.96</u>
Workers' Bonuses	3.67	4.03	4.24	4.66	4.89	5.38	5.65
<u>NET PROFIT</u>	<u>20.56</u>	<u>23.19</u>	<u>27.66</u>	<u>28.93</u>	<u>36.90</u>	<u>39.91</u>	<u>48.31</u>
Times interest earned	4.8	5.3	6.0	6.3	5.8	6.3	7.5

- 1/ Based on average annual increase of 9% in amount of units sold; gross revenue figures also reflect increases in power rates obtained by UTE during the latter part of 1955, which increased gross revenue from power operations on the average by 13.5%.
- 2/ The decrease in operating expenses in 1960 is due to a decrease in fuel costs as a result of the coming into operation of the Baygorria hydro plant.
- 3/ Based on an average annual increase in volume of traffic of 9%; gross revenue figures also reflect increases in telephone rates obtained by UTE during latter part of 1955, which increased gross revenues from telephones on the average by 25%.

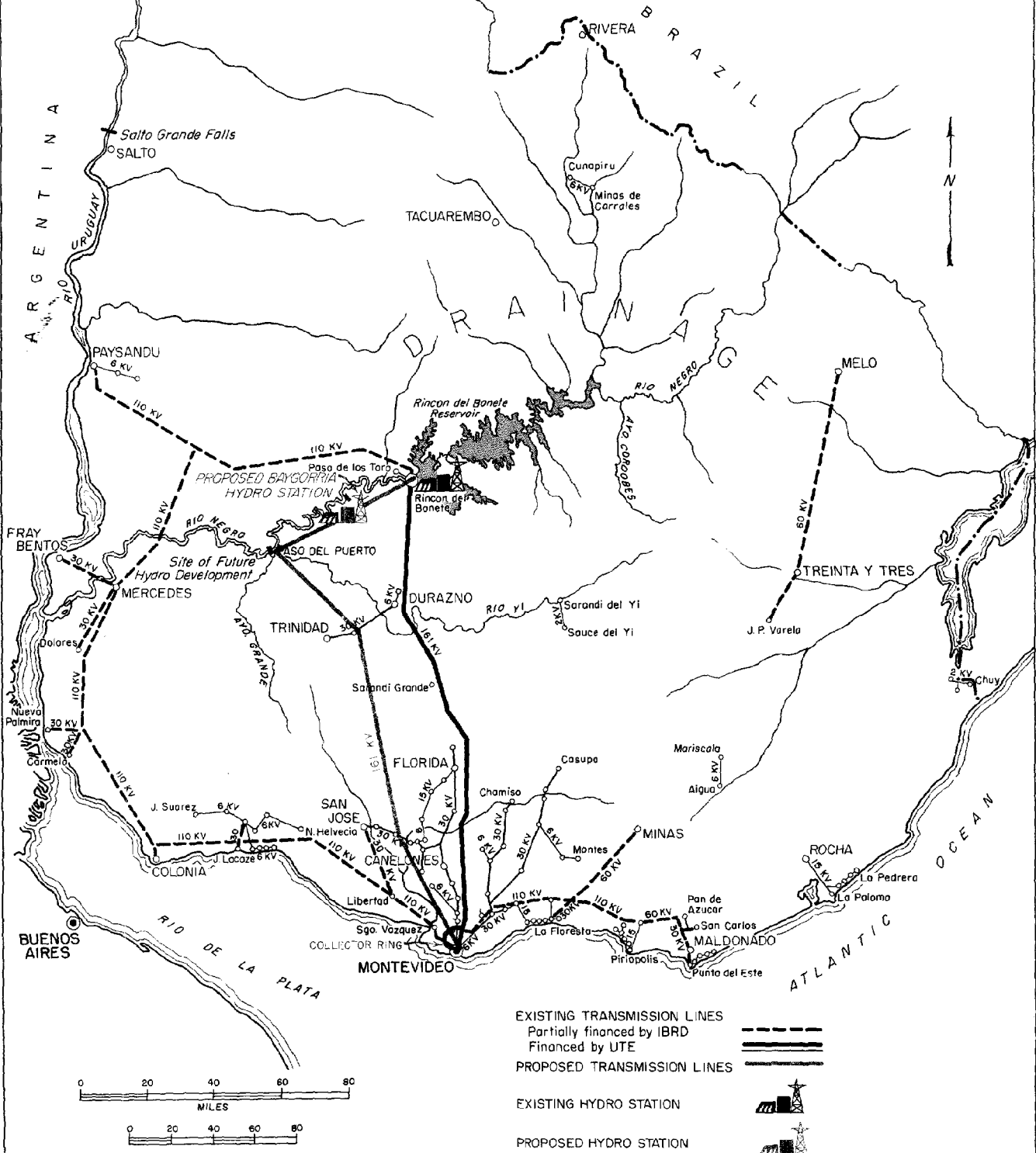
U.T.E. Forecast of Receipts and Expenditures  
(in millions of Pesos)

Annex J

<u>RECEIPTS</u>	<u>1956</u>	<u>1957</u>	<u>1958</u>	<u>1959</u>	<u>1960</u>	<u>1961</u>	<u>1962</u>
1. Net Profit	20.56	23.19	27.66	28.93	36.90	39.91	48.31
2. Depreciation allowances	12.26	12.65	13.53	15.18	19.37	20.32	21.11
3. Receipts from operations	32.82	35.84	41.19	44.11	55.27	60.23	69.42
4. Borrowing:							
a) IBRD loans:							
(i) Loan No. 30-UR (balance)	2.19						
(ii) Loan No. 132-UR	10.05	1.50					
(iii) Proposed Loan	4.37	12.62	19.93	12.07	3.74	.82	
b) Sale of local bonds (net) <u>a/</u>		4.18	8.35	4.18			
Total Receipts	<u>49.43</u>	<u>54.14</u>	<u>69.47</u>	<u>60.36</u>	<u>60.01</u>	<u>61.05</u>	<u>69.42</u>
<u>EXPENDITURES</u>							
6. Capital Expenditures:							
a) to complete IBRD Project - Loan No. 30-UR	3.45						
b) to complete Second Unit Steam Plant - Loan No. 132-UR	7.39	2.03					
c) Proposed IBRD Project	8.05	26.50	33.64	26.58	11.88	7.57	
d) other construction	13.41	24.97	24.73	24.42	21.93	23.27	24.87
Total construction	32.30	53.50	63.37	51.00	33.81	30.84	24.87
7. Repayment of debt (principal)							
a) IBRD Loan No. 30-UR	2.51	2.51	2.51	2.51	2.51	2.51	2.51
b) IBRD Loan No. 132-UR			.32	.34	.35	.36	.38
c) Proposed IBRD Loan						.76	1.59
d) Other debts (existing and proposed)	2.71	2.85	3.00	3.18	3.28	3.41	3.55
8. Other Expenditures	5.98						3.00
	<u>43.50</u>	<u>58.86</u>	<u>69.20</u>	<u>57.03</u>	<u>39.95</u>	<u>37.88</u>	<u>35.80</u>
9. Cash Accruals (annual)	5.93 (-)	4.72	.27	3.33	20.06	23.17	33.62
10. Cash Accruals (cumulative)	5.93	1.21	1.48	4.81	24.87	48.04	81.66

a/ Assumes sales of 5 million 5% peso bonds during the years 1957 and 1959, and 10 million in 1958 at an average sales price of 83.5. Although no sales of local bonds are shown for 1960, 1961 and 1962, it is possible that some bonds will be sold during these years, especially if additional expansion programs are then under way.

# UTE HYDRO POWER AND TRANSMISSION LINE PROJECT URUGUAY



JUNE 1956

IBRD-269